




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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/678,799	10/03/2003	Tobias Gerlach	KOA 0242 PUS (R 1415)	3893
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BROOKS KUSHMAN P.C. 1000 TOWN CENTER TWENTY-SECOND FLOOR SOUTHFIELD, MI 48075			EXAMINER WEST, JEFFREY R	
			ART UNIT 2857	PAPER NUMBER

DATE MAILED: 11/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/678,799	Applicant(s) GERLACH, TOBIAS	
	Examiner Jeffrey R. West	Art Unit 2857	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 August 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3, 6, 7, 9-13 and 16-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 6, 7, 9-13 and 16-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

1. Claims 1, 6, 7, 9, 10, 11, and 16-20 are objected to because of the following informalities:

In claim 1, line 1, to avoid problems of antecedent basis, "the frequency" should be ---a frequency---.

In claim 1, line 2, to avoid problems of antecedent basis, "the armature" should be ---an armature---.

To be in accordance with the limitation in parent claim 1 of "determining the frequency of the current ripples", in claim 6, line 2, "the current ripple frequency" should be ---the frequency of the current ripple---. A similar change should be made to claim 7, line 2, claim 9, line 2, and claim 10, line 4.

In claim 9, line 2, to avoid problems of antecedent basis, "the operation" should be ---operation---.

In claim 11, line 1, to avoid problems of antecedent basis, "the frequency" should be ---a frequency---.

In claim 11, line 2, to avoid problems of antecedent basis, "the armature" should be ---an armature---.

To be in accordance with the limitation in parent claim 11 of "determining the frequency of the current ripples", in claim 16, line 2, "the current ripple frequency" should be ---the frequency of the current ripple---. A similar change should be made to claim 17, line 3, claim 18, line 3, and claim 19, line 5.

In claim 18, line 3, to avoid problems of antecedent basis, "the operation" should be ---operation---.

In claim 20, line 1, to avoid problems of antecedent basis, "the frequency" should be ---a frequency---.

In claim 20, line 2, to avoid problems of antecedent basis, "the armature" should be ---an armature---.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 20 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 20 is considered to be vague and indefinite for several reasons.

First, in lines 6-7, claim 20 recites "determining a frequency spectral result of the armature current signal of the motor during a second operating stage of the motor". This limitation is unclear because the claim already includes a limitation of "determining a frequency spectral result of the armature current signal of the motor during a first operating stage of the motor". It is therefore unclear how the same armature current signal can be determined during first and second operating stages of the motor. Therefore, since it is unclear how "the armature current signal" can be

determined during both the first and second operating stages of the motor, it is unclear to one having ordinary skill in the art as to what is being claimed.

Claim 20 is further considered to be vague and indefinite because it recites, in lines 10-19, "determining a frequency spectral result of the current ripples contained in the armature current signal based on differences between the frequency spectral result of the armature current signal during the first operating stage of the motor and the frequency spectral result of the armature current signal during the second operating stage of the motor such that the determined frequency spectral result of the current ripples contained in the armature current signal is void of frequency components which are superimposed on the armature current signal as interference; and determining the frequency of the current ripples contained in the armature current signal from the determined frequency spectral result of the current ripples contained in the armature current signal" (emphasis added).

The emphasized limitations of "the armature current signal" are considered to be vague and indefinite because claim 20 already presents limitations for both "the armature current signal of the motor during a first operating stage of the motor" and "the armature current signal of the motor during a second operating stage of the motor". Therefore, it is unclear to one having ordinary skill in the art as to which armature current signal the recitations of "the armature current signal" refer, and further unclear as to which signal the frequency spectral result of the current ripples is determined as well as to which signal the frequency components are superimposed as interference.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-3, 6, 11-13, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,977,732 to Matsumoto in view of U.S. Patent No. 3,935,512 to Falk et al. and further in view of U.S. Patent No. 6,038,532 to Kane et al.

Matsumoto discloses a method for determining the frequency of current ripples contained in an analog armature current signal of a commutated direct current motor (column 6, lines 31-32 and 60) comprising determining an armature current signal (column 6, lines 34-37 and column 7, lines 20-21), determining a result of the current ripples contained in the armature current signal based on the armature current signal and determining a current ripple frequency from the current ripples contained in the armature current signal, without filtering (column 7, lines 18-21), during a start-up phase of the motor (column 6, lines 37-50 and column 11, lines 11-17).

Matsumoto discloses determining the rotational speed of a drive shaft of the motor based on the current ripple frequency (column 7, lines 25-28).

Matsumoto discloses monitoring the current ripple frequency for changes during the operation of the motor (column 12, lines 13-27 and 52-60) by counting the

current ripples contained in the armature current signal and modifying the number of counted ripples as a function of a changes in the current ripple frequency (column 7, lines 33-38).

As noted above, the invention of Matsumoto teaches many of the features of the claimed invention and while the invention of Matsumoto determines current ripples in an armature current signal, Matsumoto does not include means for removing interference from the armature current signal using a voltage signal that contains the interference.

Falk teaches a circuit for the compensation of current interference signals including means for determining a useful part of a current signal (column 3, lines 58-66) by sensing a current signal containing a useful part and interference (column 3, lines 1-9), obtaining a voltage signal that contains the interference (column 3, lines 14-21) and subtracting the voltage signal from the current signal to result in the current signal void of interference (column 3, lines 30-34).

It would have been obvious to one having ordinary skill in the art to modify the invention of Matsumoto to include means for removing interference from the armature current signal using a voltage signal that contains the interference, as taught by Falk, because it is considered to be well known in the art, as well as admitted by Applicant (specification, page 1, lines 14-15), that an armature current signal, such as that of Matsumoto, contains interference and, as suggested by Falk, the combination would have provided means for removing the interference to improve the detection of the ripple component by distinguishing the part of the signal

that is representative of the device operation from disturbances caused by a source (column 1, lines 61-66).

As noted above, the invention of Matsumoto and Falk teaches many of the features of the claimed invention including subtracting a noise component represented by a voltage signal from an armature current signal to determine the resulting current ripple, but does not teach performing the subtraction digitally using a Fourier transform.

Kane teaches a signal processing device for canceling noise in a signal including means for sensing an analog signal containing both a useful signal component and a noise component (column 2, lines 38-41), digitizing the analog signal (column 2, lines 42-44) and determining a frequency spectral result of the digitized signal using a fast Fourier transform (column 2, lines 45-48) and canceling the noise component of the signal by subtracting a noise prediction signal (column 3, lines 26-32).

It would have been obvious to one having ordinary skill in the art to modify the invention of Matsumoto and Falk to include performing the subtraction digitally using a Fourier transform, as taught by Kane, because Kane suggests a method for frequency analysis that is well-known in the art to provide the user with easier mathematical analysis and more accurate analysis due to the signals being better defined in classical mathematical signal processing terms and, as suggested by Kane, provided better interference elimination by completely eliminating the noise through clearly defined spectral frequencies (column 3, lines 28-43).

6. Claims 7, 9, 10, 17, 18, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsumoto in view of Falk et al. and Kane et al. and further in view of U.S. Patent No. 4,952,854 to Periou et al.

As noted above, Matsumoto in combination with Falk and Kane teaches many of the features of the current invention including determining a rotational speed of a drive shaft of the motor based upon a the current ripple frequency but does not specify determining the position based upon the rotational speed.

Periou teaches a control device for a DC motor intended for driving opening elements on an automobile, such as a window (column 1, lines 23-25), including means for determining the rotational speed of the motor and from this speed determining the angular position of the motor shaft (column 2, lines 44-50).

It would have been obvious to one having ordinary skill in the art to modify the invention of Matsumoto, Falk and Kane to include determining the position based upon the rotational speed, as taught by Periou, because Periou suggests a method for controlling the operation of a window motor in a vehicle to stop upon detection of an object, similar to that of Matsumoto, Falk, and Kane, that would have improved operation by actively determining position as compared to a set value as well as avoiding unnecessary stoppages by taking into account parameters of the circuit (column 2, line 45 to column 3, line 3).

7. Claim 20, as may best be understood, is rejected under 35 U.S.C. 103(a) as

being unpatentable over Matsumoto in view of Falk et al. and Kane et al. and further in view of U.S. Patent No. 3,829,754 to Rettig.

As noted above, Matsumoto in combination with Falk and Kane teaches many of the features of the claimed invention including determining a spectral result of current ripples contained in an armature current signal based on difference between the frequency spectral result of a current armature current signal and a second spectral result, but the combination teaches the second spectral result to be a voltage signal rather than a current signal at a different operating speed.

Rettig teaches a compensated adjustable frequency power supply including means for determining a current ripple (column 8, lines 37-41) wherein the current rippling in a current signal is present in a current determined at a second operating state and not at a first initial operating state, wherein the operating states are different rotational speeds (column 8, lines 59-65).

It would have been obvious to one having ordinary skill in the art to modify the invention of Matsumoto, Falk, and Kane to include means for specifying that the second spectral result to be a current signal at a different operating speed, as taught by Rettig, because the invention of Matsumoto, Falk, and Kane suggest an accurate method for determining current ripple without the influence of source noise, and Rettig suggests a functionally equivalent method for determining the current ripple, similar to that of Matsumoto, Falk, and Kane by determining the difference between two separate states of current when the first state is not effected by the ripple thereby indicating that any difference between the current states is due to the ripple

itself (column 8, lines 59-65). Therefore, the combination would have provided means for determining the current ripple in instances when the voltage signal of Matsumoto, Falk, and Kane is not easily obtainable.

Response to Arguments

8. Applicant's arguments with respect to claims 1-3, 6, 7, 9-13, and 16-20 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to Applicant's disclosure.

U.S. Patent No. 4,736,307 to Salb teaches a microcomputer-based system for performing Fast Fourier Transforms wherein the analog signals being analyzed are first digitized at each point in time and then analyzed using a fast Fourier transform to obtain an unfiltered frequency spectral result (column 7, lines 46-48) as well as a teaching that this method for frequency analysis provides more accurate analysis due to the signals being better defined in classical mathematical signal processing terms (column 7, lines 28-34)

U.S. Patent No. 5,359,275 to Edwards teaches a load current fundamental filter with one cycle response including a means for calculating a current ripple wherein the current ripple is determined by subtracting the current at a first state from the current at a second state (column 4, lines 48-60 and column 10, lines 16-20).

U.S. Patent No. 6,559,616 to Aoki et al. teaches a rotational pulse generating circuit for motors including means for removing the noise superimposed on the ripple of a current signal.

U.S. Patent No. 5,434,634 to Yoshida teaches a camera with data recording device and data recording method including means for detecting a ripple signal with extraneous noise.

U.S. Patent No. 4,525,662 to Kato et al. teaches a battery charging control system for an automobile wherein a ripple level of a generator is proportional to both an output current of the generator and the rotation speed of the generator.

U.S. Patent No. 4,744,041 to Strunk et al. teaches a method for testing DC motors including means for determining current ripple.

JP Patent Application Publication No. 07-245979 to Okada teaches a speed controller for an AC motor including means for calculating a difference between a ripple peak and an average speed.

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffrey R. West whose telephone number is (571)272-2226. The examiner can normally be reached on Monday through Friday, 8:00-4:30.

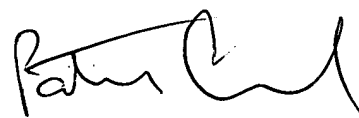
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marc S. Hoff can be reached on (571)272-2216. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Art Unit: 2857

jr

October 29, 2004

A handwritten signature in black ink, appearing to read "Patrick Assouad". The signature is fluid and cursive, with a large initial "P" and a long, sweeping underline.

PATRICK ASSOUD
PRIMARY EXAMINER